

Consent for Research Participation

Study Title: Random Keystroke Dynamics for Pattern Recognition and Authentication Modeling

Researcher(s): Jacqueline Blake, Hiroki Sayama

Researcher Contact Info: 516 578 8411 and jblake3@binghamton.edu

You are invited to take part in a research study conducted by the researchers named above. Below is detailed information for you to consider when determining whether or not to participate. Carefully consider all of this information and ask any questions you may have about it before deciding whether to participate or not.

Key Information for You to Consider

- **Voluntary Consent:** You are being asked to volunteer for a research study. It is your choice whether to participate or not. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate or to discontinue participation.
- **Purpose:** The purpose of this research is to explore patterns in human typing of random keystroke (how individuals type unpredictable or non-repetitive sequences) can serve as a unique behavioral biometric for user authentication. By analyzing timing and rhythm in keystrokes, the study aims to contribute to the development of non-intrusive, secure, and user-friendly cybersecurity authentication methods.
- You are invited to participate because you are
 - ✓ Age 18 or older
 - ✓ You are English language proficient
 - ✓ You have access to a keyboard and ability to type
 - ✓ You can decide to agree to participate
- It is expected that approximately 40 individuals will be participating in this research.
- **Procedures and Activities:** You will be asked to complete a brief online study involving five, 60 second random typing (typing on your keyboard randomly) using your own computer and standard keyboard. These random keystroke tasks will proceed with an on-screen timer countdown while the system records the timing and rhythm of your keystrokes. At the end of the countdown, you will be asked to download your files and email them to the primary researcher (email: jblake3@binghamton.edu). You will also complete a short demographic questionnaire. The study can be completed at any location with internet access, at a time convenient for you. There is no script to follow, and you do not have to type actual words. There is no compensation for participating in this research.
- **Duration:** Your time commitment will be approximately 15–25 minutes.
 - **Risks:** Some of the foreseeable risks or discomforts of your participation include minor fatigue or discomfort from keyboard use during the typing tasks.
Risks are minimal and comparable to everyday computer use. Participants may pause or stop participating at any time. Breach of confidentiality is possible in this research
- **Benefits:** Some of the benefits that may be expected include contributing to research that may lead to improved digital security and authentication systems.
Helping researchers develop non-intrusive, low-cost biometric technologies that can be used to enhance cybersecurity, accessibility, and user experience. However, researchers cannot guarantee that the participant will receive any direct benefit.
- **Alternatives:** Participation is voluntary and the only alternative is to not participate.

We will tell you about any new information that may affect your willingness to continue participation in this research.

What happens to the information collected for this research?

The information collected in this study such as keystroke timing data and anonymous demographic responses, will be securely stored on Binghamton University's Google Drive system, which is password-protected and access-limited to the research team. All data will be labeled using unique participant codes to ensure anonymity, and no personally identifiable information will be collected.

The data will be used solely for research and academic purposes, including statistical analysis and the development of behavioral models. Findings may be published or presented at conferences in aggregate form only, with no way to identify individual participants. In accordance with university policy, the data will be retained for a minimum of three years and then securely deleted or archived.

Your information and/or specimens will not be used or distributed for future research studies even if all identifying information is removed. We will tell you about any new information that may affect your willingness to continue participation in this research.

How will my privacy and data confidentiality be protected?

We will take measures to protect your privacy, including non-collection of personally identifiable information (such as your name, email address, or IP address). All data will be linked only to a randomly assigned participant ID. All results will be reported in a summarized, aggregated form, ensuring that no individual can be identified in any publications or presentations.

You are free to withdraw at any time, and any data collected up to that point will be excluded upon request.

We will take measures to protect the security of all your personal information including restricting access to authorized research team members only, using secure, password-protected storage on Binghamton University's encrypted Google Drive system, assigning unique participant IDs instead of names, and avoiding the collection of direct identifiers (such as names, email addresses, or IP addresses). All data will be transmitted and stored using secure methods, and findings will be reported only in aggregated, non-identifiable form to ensure confidentiality.

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Please note that email communication is neither private nor secure. Though we are taking precautions to protect your privacy, you should be aware that information sent through e-mail could be read by a third party.

Despite these precautions, we can never fully guarantee your privacy or the confidentiality of all study information. Individuals and organizations that conduct or monitor this research may be permitted access to inspect the research records, including accessing your private information. These individuals and organizations include approved study team members, and the Binghamton University Institutional Review Board (IRB)

This research will remain confidential unless we are required by New York State Law to report harm to yourself or your children.

What if I want to stop participating in this research?

Taking part in this research study is your decision. Your participation is voluntary. You do not have to take part in this study, but if you do, you can choose not to participate in any study activity or to completely withdraw at any point without penalty or loss of benefits to which you are otherwise entitled. Participants have the option to

skip questions they choose not to answer and/or opt out of task anytime. Your decision whether to participate will not affect your relationship with the researcher(s) or Binghamton University.

Consent to be contacted for participation in future research:

Researchers may wish to keep your contact information to invite you to be on future research projects that may be similar to or completely different from this research project.

- May we contact you again about potential participation in future studies? ☐YES ☐NO

Who can answer my questions about this research?

If you have questions, concerns, or have experienced a research related injury, contact the research team at:

- Jacqueline Blake
- 516 578-8411
- Jblake3@binghamton.edu

Binghamton University's IRB is overseeing this research. The IRB is a group of people who perform independent reviews of research studies to ensure the rights and welfare of participants are protected. If you have questions about your rights or wish to speak with someone other than the research team, you may contact:

- The Binghamton University IRB
- hsrrc@binghamton.edu
- (607) 777 - 3818

STATEMENT OF CONSENT

I have had the opportunity to read and consider the information in this form. I have asked any necessary questions to make a decision about my participation. I understand that I can ask additional questions throughout my participation. I understand that by contacting the researcher and moving forward with the tasks, I am voluntarily participating in this research. I understand that I am not waiving any legal rights, I may obtain a copy of this consent form, and I am at least 18 years old.